

# I Sing the Body Electric: Speculations on the Future of Internet-mediated Musical Creativity

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## Project aims

In previous research I had done on dance styles from underground and urban subcultures, I argued that technology is changing the way humans dance (Maranan, Schiphorst, Bartram, & Hwang, 2013) and predicted that we will continue to see new technological metaphors translated into expressive movement vocabularies. In *I Sing The Body Electric: Speculations on the Future of Internet-mediated Musical Creativity* (working title) I aim to extend this argument by exploring how the Internet is changing patterns of creative cognition and behaviour. Focusing on music as the central creative activity, I will attempt to forecast how the Internet will (if at all it does) influence creative cognition and behaviour in the near future.

## Research questions

The project has three main research questions that correspond to the three major aims of the project. I expect to refine and narrow the scope of the questions during the course of the research.

1. What theoretical frameworks and existing empirical evidence compellingly describe how the Internet currently mediates creative behaviour and cognition?
2. What are new and radical emerging practices on the Internet, and where might they lead?
  - a. What are emerging online subcultures/communities of musical practices?
  - b. How might such concepts such as virtuosity, intimacy, transcendence, presence, togetherness, or beauty figure in these emerging practices?
  - c. How do affordances of Internet technologies contribute towards the articulation or development of such concepts, particularly in collaborative creative contexts?
3. How else can technological tools and artefacts support or augment new and emerging creative practices that are mediated by the Internet?
  - a. What design principles can be brought to bear to address these needs?
  - b. What are some unmet needs of professional and amateur communities of practice collaborating to create music that articulate or develop such concepts?
  - c. How can we leverage the affordances of Web2.0- and mobile-based tools to support, enhance, or augment new music creation practices?

## Background to the research

It has been argued persuasively (boyd & Ellison, 2007; Herring, 1996; Rheingold, 2000) that the Internet has influenced much of our experiences around communicating and collaborating with other people over the past twenty years. This assertion is as true about common, everyday experiences in general as it is about creative and artistic practices in particular. For instance, various multimedia phenomena—including online games, hypertext fiction (Douglas, 1989), hyperperformances (G. H. Brown & Hauck, 2009), and transmedia storytelling (Jenkins, 2009)—extend the manner by which textual, visual, sonic, and interactive experiences constitute a digital *gesamtkunstwerk* (Packer, 1999). A compelling argument can be made—as Manovich (2001) did in the case of ‘new’ media—that novel materials, techniques, and processes can animate new creative paradigms. But while Manovich’s account of the language of new media sharply brings into focus the unique operations that can be done on new media’s constituent components (numerical representation, modularity, automation, variability, transcoding), it did not adequately anticipate the massive social

connectivity that Internet brings.<sup>1</sup> It is the form of connectivity that is “rhizomatic” (Deleuze & Guattari, 1987): highly connective, heterogeneous, and resistant to rupture (Carmi, Halving, Kirkpatrick, Shavitt, & Shir, 2007). Indeed, perhaps the Internet represents such a breaking change in human social organization that it is not only postmodern but even, as philosopher Alan Kirby suggests, “post postmodern” (2006).

What new and radical emerging practices in music creation, production, and distribution are being afforded by Internet-based technologies in professional and amateur communities of musical practices? How might such concepts such as virtuosity, intimacy, transcendence, presence, togetherness, or “musical beauty” (Shank, 2014) figure in these emerging practices? How do affordances of internet-capable devices contribute towards the articulation or development of such concepts, particularly in collaborative creative contexts? In other words: an increasingly large part of contemporary creative culture is increasingly entwined with Internet technologies, but what form is this entanglement taking precisely?

### **Theoretical foundations: The Internet as tool, collaborator, prosthesis, and peer**

At this stage of my research, I propose four ways of understanding our creative relationship with the Internet that might be useful in forecasting the future of Internet’s effect on human creativity and cognition: as tool, collaborator, prosthesis, and peer.

I sketch out these ideas in this section in part by referencing them against a particular case, the Japan Tribute collaborative mobile karaoke song (Smule, 2013). In 2010, San Francisco-based company Smule released a mobile app called Glee Karaoke. The app allowed its users to record their voices on top of instrumental tracks of well-known pop songs. It also allowed users to combine their vocal track with those of other users. On March 11, 2011, a devastating tsunami hit Japan. The damage was enormous and the suffering incalculable. In response, Smule user Mayo57 recorded a rendition of the 1972 Bill Withers song, “Lean on Me” and invited other Smule users to add their own voices to the track as a display of “solidarity, empathy, and hope” (Smule, 2013). Over three thousand people from around the world responded and contributed their voices in a stunning example of crowdsourced, improvisational music-making.<sup>2</sup>

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<sup>1</sup> Manovich’s framework does anticipate the “mobile revolution” (Steinbock, 2005), which sits slightly outside of (but alongside) Web2.0 and calls attention to notions of ubiquity, mobility, and embodied experience (Dourish, 2001; Shusterman, 2008), primarily since a tremendous amount of computing power can be contained in a device small enough to fit in one’s pocket. Location-aware, these devices can sense and respond to a variety of types of human gestures and actions. Above all, it has the potential to be perpetually connected to the Internet. While ‘being Web2.0’ is being connected, the mobile revolution further amplifies connectivity to the point of pervasiveness.

<sup>2</sup> See <http://www.youtube.com/watch?v=n2MYS81BC5o> for archived video of the resulting song.

What are we to make of this phenomenon? Does it signify a significant departure from other technologically-mediated ways of music-making? Or is it an entirely predictable consequence of technological use for creativity? After all, while new technologies might lead to increased or more diverse artistic output, they do not necessarily lead to radical new aesthetics. For instance, composer and conductor Eric Whitacre crowdsourced singers online for a “virtual choir” (Linver, 2011); yet while novel in its approach for assembling a cast of voices, the musical output remains traditional in form.

### **As tool: The Internet *is useful to us***

Within fields in social studies of technology, two positions are often brought to bear on the discourse around the relationship between humans and the Internet. Social constructivist accounts of technology argue that technologies are essentially neutral and merely support how humans enact their will upon the world (Bijker, Hughes, & Pinch, 1987). Any meaning, value, or use of technological phenomena is socially determined. A social constructivist position on the Japan Tribute case, for example, might insist that Internet was merely instrumental in recruiting people from across a vast geographical spread. The Japan Tribute case is compelling only because communal offering of support and optimism through shared singing—a fundamentally non-technological activity—is in itself compelling.

Technological determinism, on the other hand, claims that technologies (including media) largely shape the course of human behaviour and social history (Ong, 1982; Smith & Marx, 1994). A form of technological determinism can be found in McLuhan’s notion of the medium as the message—according to this theory, the properties of the communication medium create a farther-reaching effect on society than the content the medium carries (McLuhan, 1964). A technological determinist stance might insist that what matters most about in the Japan Tribute phenomenon is that users are demonstrating a reorganized understanding of community. The mobile phone (it could be argued) is fundamentally transforming people’s capacity to monitor, discuss, and participate in global affairs.

Our question might then be this: does the Internet merely enable existing creative practices to be scaled, extended, or otherwise augmented (as a social constructivist might expect), or does it lead to truly novel forms of creative practices (as technological determinists would predict)?

### **As collaborator: the Internet *resists and enables us***

Pitting technological determinism against another social constructivism assumes that both positions cannot hold true at the same time. Latour (1994) proposes a third possibility that sits somewhere in between—technological mediation by translation—in which technologies and humans can be seen as having comparable agency as “actants”, each of whom mediates the other. To illustrate his case, Latour uses the issue of gun violence: do guns kill people (technological determinism) or, as the American National Rifle Association argues, do “people kill people” (social construction of technology)? Neither answer is satisfactory, according to Latour. A gun is not the same gun when it is in someone’s hands, and a person is not the same person when they possess a firearm. The gun, the

person, and the-person-with-a-gun each “afford” (to borrow a term from design and human-computer interaction studies) different possible outcomes.

We can extend this line of argument to the case of the Internet. The Internet can be seen as a constantly negotiated collaboration between computers and human users. Together, they form what could be argued as an integrated information-processing agent that is greater than the sum of computer-plus-human, and this hybrid system produces creative cognition and creative behaviour.<sup>3</sup> In the Japan Tribute case, the Glee Karaoke app—and the networked computers that support its functioning—could only afford its users a particular range to participate in a musical experience. Indeed, the app offers a kind of resistance against which the user must find their creative voice. Adam Evens persuasively draws out the importance of the musical instrument’s resistance against the performer:

Defined by its resistance, the instrument does not just yield passively to the desire of the musician. It is not a blank slate waiting for an inscription. Likewise, the musician does not just turn the instrument to his own ends, bending it to his will against whatever resistance it offers. Rather musician and instrument meet, each drawing the other out of its native territory. The instrument itself has a potential, a matter-to-be-determined, and its use is always in relation to its own character as well as the desire of the musician. (Evens, 2005, p. 160.1)

Evens’ observation lends support to the notion of the musical instrument as a collaborative partner of the human musician. Bearing this in mind, I am curious to understand the resistances of Internet technologies, and how they might afford new and medium-specific forms of musical expression.

#### **As prosthesis: The Internet *is part of us***

Latour’s argument resonates with studies of cognition as a distributed process (Hutchins, 1995) or an extended system (Clark & Chalmers, 1998). Within the framework of distributed cognition, “humans create their cognitive powers by creating the environments in which they exercise those powers” (Hutchins, 1995, p. xvi). The Internet could be construed as both a technological and a social system that constitutes one such environment in which humans exercise creative abilities that otherwise.

The extended cognition proposition takes distributed cognition a step further. In distributed cognition, artifactual and technological systems interact with social systems, but each system is still seen to operate under its own logic. Extended cognition argues that the line between self and the environment is a blurred one in the first place, and that it is arbitrary to draw the boundary of the mind along the contours of the skin. For instance, people rely on notebooks to aid with information storage and calculators to help quantitative processing. As such, these tools could be considered as part of (and not just supportive of) cognitive functioning.

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<sup>3</sup> This argument runs along the same lines as the “systems reply” to Searle’s well-known Chinese Room scenario (Searle, 1980).



Both theories recall the spirit of Haraway's (1991) manifesto seeking to erase distinctions between human and machine, the self and the Other, as well as McLuhan's suggestion that "all media are extensions of some human faculty—psychic or physical" (McLuhan & Fiore, 1967). This is not necessarily groundbreaking, at least not to new media artists. For instance, Stelarc's Internet Ear features an artificial ear embedded in an arm and linked to a computer:

When visitors spoke to the ear, the speech recognition system interpreted what was said and the text to speech system spoke their words out aloud in all of the gallery spaces simultaneously... A website enabled people elsewhere to click on the ear and input text to be spoken and be heard elsewhere. (Stelarc & Lustig, n.d.)

In a similar vein, the Fragmented Orchestra is a large-scale "distributed instrument" (Jones et al., 2009) that generates an interactive soundscape from user voices, using a neuronal model of brain activity to guide the digital processing of the audio. In doing so, it extends not only the reach of vocal production and but also auditory cognition.

### **As peer: The Internet *could become like us***

The extended mind hypothesis recalls panpsychism, the belief that consciousness is inherent in all things and which follows both Buddhist philosophy and arguments by Western philosophers such as Plato, Spinoza, Leibniz, Schopenhauer, James, White, and Russell (Tononi & Koch, 2014). It appears to resolve what has been called the "hard problem" of consciousness (Chalmers, 1995), but perhaps it does so too neatly. Weaker versions of panpsychism exist in the form of materialist explanations of consciousness. For instance, Tononi and Koch (2014) propose Information Integration Theory (IIT). In IIT, consciousness is a graded, inevitable property of all highly networked systems, even as they are careful to insist that not everything is conscious. According to IIT, the Internet might then be said to experience some form of consciousness (Paulson, 2012).

One objection to IIT comes from the embodied perspective of cognition (Dourish, 2001; Lakoff & Johnson, 1999). Consciousness (or at least consciousness as we know it) requires not only cognitive processing capability but also the ability to sense the external world and act upon it in order to build and test internal representations of knowledge that scaffold experience. Where are the sensory organs of the Internet? Where are its hands?

That the Internet might (eventually) possess a sensing, moving body is not so absurd. In the emerging "Internet of Things", a variety of objects—including sensors, actuators, and identifying tags—will be directly addressable and manipulable (Atzori, Iera, & Morabito, 2010). The vision, as articulated by some of its proponents, is to create a system that is capable of sensory perception:

We need to empower computers with their own means of gathering information, so they can see, hear, and smell the world for themselves, in all its random glory... [Identification technology and] sensor technology

enable computers to observe, identify, and understand the world—without the limitations of human-centred data. (Ashton, 2009)

Consider what might happen as well as the numerous heuristics, algorithms, and systems for specific intelligent tasks—deduction, decision-making, knowledge representation, classification, planning learning (Russell & Norvig, 2009)—become more integrated in an Internet of Things. If highly connected, information-processing modules have the capacity to sense, reason about, and physically act on the world, could the network be said to be conscious? If it is, could it be intrinsically motivated to create art? Could it make music? How, and what would it sound like?

I have thus far briefly sketched three views on how the Internet influences our ability to act and think creatively, and a fourth view that proceeds from the possibility of the Internet emerging to possess some manner of creative agency. These four views form the start of my theoretical investigation into the future of Internet-mediated creativity and will inform my ethnographic study of online musical communities, which I discuss next.

### **Online musical communities**

A constellation of Internet-based information and communication technologies and protocols, known popularly as “Web 2.0” (O’Reilly, 2005), has led to the rise of online communities. Different types of online communities exist for ‘traditional’ art forms, including dance, music, and visual arts; these virtual communities of creative practice are organized either partly or largely online (Kozinets, 2010; Porter, 2004). For instance, certain genres of urban dance are constituted of dancers who learn, rehearse, and perform predominantly using social networking sites, online forums, and online video sites (Maranan et al., 2013). Social online network sites such as deviantART showcase hundreds of millions of original artwork generated by tens of millions users (Salah et al., 2012). An online community of musicians, who share their work on the website ccMixter.org, remix other musicians’ work and reciprocally allow their work to be remixed in turn (Yew, 2009). Social networking sites such as SoundCloud focus on sociality and allow its users to share, forward, “like”, and comment on user generated audio artefacts (Bogdanov et al., 2011). Companies such as Smule design and produce mobile apps (such as a digital ocarina) that encourage “musical social intercourse” between non-professional musicians (Wang et al., 2009). Designer-programmers leverage both emerging and widely accepted standards in Internet and Web technologies, such as UDP and HTML5, to create toolkits that allow even novice programmers to quickly create new musical interfaces that support collaborative music making (Taylor, Allison, Conlin, Oh, & Holmes, 2014). A particularly Web 2.0 phenomenon, crowdsourcing, relies on user-generated material as grist for the creative mill by artists, including musicians such as Eric Whitacre, who crowdsourced singers online for a “virtual choir” (Linver, 2011).

In this project, I will conduct an exploratory internet-based ethnography—a “netnography” (Kozinets, 2010)—of online communities of musical practice, with a particular focus on marginal subcultures. I do so on the belief (which I

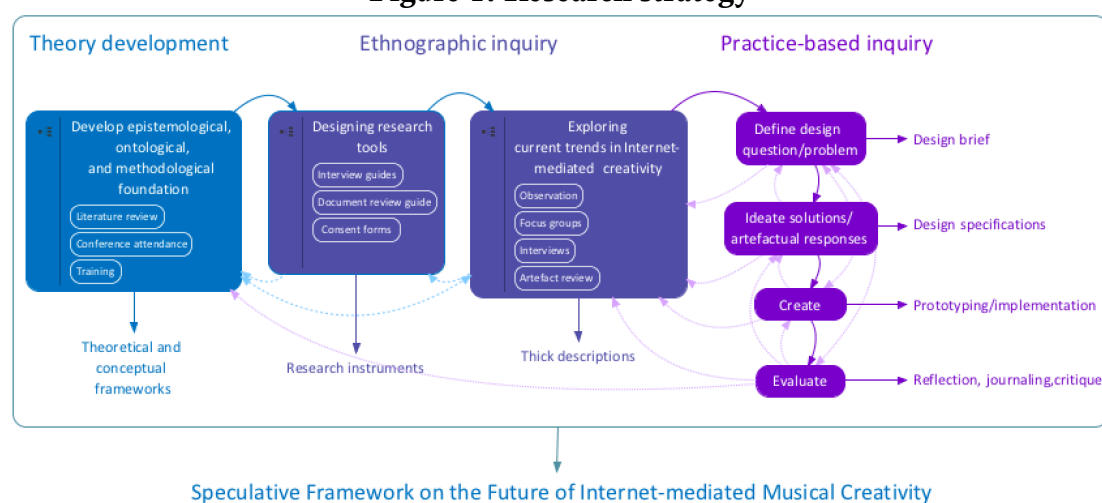
hope to substantiate) that some future trends arise from interesting and compelling phenomena in the margins.

## Research Methods and Strategies

*I Sing the Body Electric* is positioned as a practice-based research project situated within the arts, through which I intend to borrow conceptual frameworks from other domains of study, including history, philosophy, anthropology, critical studies, future studies (Kurzweil, 2000), and human-computer interaction (Fallman, 2003). While not explicitly design research (T. Brown, 2008; Goldschmidt & Rodgers, 2013; Lockwood, 2009; Martin & Hanington, 2012; Rowe, 1991), this project is aligned with the approaches in “speculative design” and “design fiction” (Dunne, 2014) comes closest to capturing the intent of this project. As such, it necessitates an interdisciplinary approach that is most closely affiliated to design. Design borrows methods from (among others) phenomenology (Groenewald, 2008; Merleau-Ponty, 1964); grounded theory (Glaser & Strauss, 1968); ethnography (Geertz, 1973; Kozinets, 2010; Marcus, 1995); and psychology (Lidwell, Butler, & Holden, 2003), which employs a positivist approach to studying perception, cognition, and social interaction.

While interdisciplinary, this research will be largely qualitative in nature, as qualitative research is appropriate for the goals of this research, which centre on understanding meaning, context, and process, as well as identifying unanticipated phenomena (Maxwell, 2004), as illustrated in Figure 1. The horizontal ordering of the phases and the arrows in the figure illustrate the dependency of the phases. However, the arrows are bidirectional and the phases heterogeneously connected because I anticipate a need to take an iterative approach in this project to arrive at the most compelling results. **The overall goal is to generate a speculative framework on the future of internet-mediated musical creativity.**

**Figure 1. Research strategy**





## **Theory development**

To begin, I aim to arrive at a conceptual framework that integrates notions of consciousness, agency, and creativity as they have been articulated in philosophy, computer science, cognitive science, neuroscience, and the humanities. Drawing on a cross-disciplinary synthesis of ideas, I look at the ways in which humans engage with the Internet to create music.

In this phase, I expect to develop epistemological, ontological, and methodological foundations sets the stage for the rest of the research, which will be achieved through the review of literature, attendance and presentation at relevant scholarly conferences, and training. Conferences attended so far include NIME (New Interfaces for Musical Expression), MOCO (Movement and Computing). Future conferences include ACM Creativity and Cognition 2015, ISEA 2015, NIME 2015, and CHI 2016. Expected output would include theoretical and conceptual frameworks that contribute to the speculative framework.

## **Ethnographic inquiry**

I then intend to build a stronger case for my conceptual framework by thickly describing unusual and compelling emerging trends in online subcultures/communities of musical practice. I will explore how these trends leverage the properties of Internet technologies—for instance, ubiquity, portability, hack ability, and capacity to provide real-time feedback—to open new ways for making, sharing, and listening to music in online communities. I expect to focus on a few specific phenomena, notions, or themes such as virtuosity, intimacy, beauty, transcendence, presence, or togetherness. Precisely which of these I will study will depend in part on the themes that emerge from the initial exploratory studies, and I expect to make a decision on which to focus on as the research progress.

I will also design research tools such as consent forms, interview guides, primary data review plans, focus group guides. Sampling strategies—which, due to the nature of the research aims, will likely consist of purposive and snowball sampling (Groenewald, 2008) will be drawn up, as will plans for coding and archiving primary data. The secondments that I take (to London, for instance) may influence the choice of communities I focus on and will influence the types of research tools that will be appropriate for the research.

The ultimate goal of this phase is to arrive at thick descriptions of collaborative creative experiences in the online communities of musical practice under study. I aim to achieve this through a combination of contextual analysis of people and the artefacts they produce. This will involve activities such as immersive fieldwork, which in turn may include activities such as semi-structured interviews, key informant interviews, focus group discussions, musical analysis, design audits, or textual analysis. I expect to identify precisely which techniques will be appropriate as the research progresses.

## **Practice-based inquiry**

Finally, I aim to integrate my findings them into a set of forecasts about the future of creativity with respect to the Internet, crystallizing my assertions as one or

more artistic artefacts. In the spirit of what Frayling (Zimmerman, Forlizzi, & Evenson, 2007, p. 1) calls the “cognitive tradition in art” (p. 4), these artefacts might be tools that can support particular areas of emergent creative activity as identified in the first phase. It may also be an artistic work that articulates in tangible form key findings from the first phase. Either way, the artefacts are created with aim of “transform[ing] the world from its current state to a preferred state” (Zimmerman, Forlizzi, & Evenson, 2007, p. 1).

I aim not only to articulate new knowledge about our creative partnership with networked technologies, but also embody this knowledge in tangible form through the design of one or more technological systems that anticipate future co-creative musical partnerships with the Internet.

## Statement of ethical research

Both phases of inquiry in this project will require working with humans, either as research subjects (in the first phase) or as co-creators (in the second phase). An application for ethical approval will be submitted to the Faculty Research Ethics Committee (FREC) following the successful outcome of my RDC1 Project Approval process.

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